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ABSTRACT

The first purpose of the study was to develop a methodology for observing young children at play in their classroom situations without access to sound. The second purpose was to use data collected under equivalent conditions and methodologies to compare the play behaviors of young deaf children to the play behaviors of their hearing counterparts. Five profoundly deaf orally trained children, 3 to 5-1/2 years old, and five hearing children participated. The procedure involved collecting taped descriptions of observed play behaviors exhibited by the Ss during their free play. The taped descriptions were then coded at 1 minute intervals with respect to frequencies in each category of social play, socio-dramatic play and organization of play behaviors. The analysis involved examination of the frequency data in terms of differences in play styles and play development across ages 3, 4, and 5 years and between the two groups of subjects--deaf and hearing. A chi-square analysis was done for each category of play between the deaf and hearing groups. The results indicate that the methodology developed in this study was both consistent and objective. The results of the comparison of play behaviors between the deaf and hearing subjects suggests that the difference is quantitative rather than qualitative. The difference between the two groups was neither within the sequence nor rate of play development, but rather within the number of behaviors observed in each category of play. Among implications noted were the restrictions of profound deafness on verbal language, environment, experience, and education. The study also suggests that play is reflective of and is an index to cognitive development. (Author/CL)

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PLAY BEHAVIORS OF DEAF AND HEARING CHILDREN

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Abstract

The present investigation dealt with play observations of young children. The first purpose of the study was to develop a methodology for observing young children at play in their classroom situations without access to sound. The second purpose of this investigation was to use a set of data collected under conditions and using methodologies which were equivalent, to compare the play behaviors of young deaf children to the play behaviors of their hearing counterparts.

Five profoundly deaf orally trained children aged 3 to 5-1/2 years old and five hearing children were selected as the subjects. The hearing subjects were matched as closely as possible to the deaf subjects for age, sex, race, and socio-economic level. The procedure involved collecting taped descriptions of observed play behaviors exhibited by the subjects during their "free play" hour in their classroom. Access to auditory input was unavailable. The taped descriptions were then typed and coded at one minute intervals with respect to frequencies in each category of social play, socio-dramatic play and organization of play behaviors.

The analysis involved examination of the frequency data in terms of differences in play styles and play development across ages: 3, 4, and 5, and between the two groups of subjects: deaf and hearing. A chi-square analysis was done for each category of play between the deaf and hearing groups.

The results indicate that the methodology developed in this study was both consistent and objective. The results of the comparison of play behaviors between the deaf and hearing subjects suggests that the difference is quantitative rather than qualitative. The difference between the two groups was neither within the sequence nor rate of play development, but rather within the number of behaviors observed in each category of play.

Although the study is recognizably limited by the small number of subjects, several implications of both practical and heuristic value were noted. Among these were the restrictions of profound deafness on verbal language, environment, experience, and education. The study also suggests that play is reflective of and is an index to cognitive development. By examining the play behaviors of non-verbal children, information about their level of cognitive symbolic functioning may become available. This would provide a non-verbal alternative to cognitive assessment of children with delayed language.

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To Learn . . .

To Grow . . .

Perchance, to play

Perhaps the most universally accepted statement about play is that there is no universally accepted definition of play! Although it is not set forth to be universally accepted, play is defined here as "the process through which a child experiments with and interprets his environment." Through manipulation, imitation, and experimentation, the child proceeds from a subjective, egocentric understanding of his world to an objective, de-centered interpretation of reality. This gradual shift from subjective to objective reality occurs as the child's cognitive abilities develop through increasingly sophisticated levels. Cognitive growth is therefore manifested in the observable play behaviors of the child. Play, then, is the external behavioral manifestation of cognitive development. Play is considered to be basic to the psychological, social, cognitive, and affective development of the young child" (Mann, 1981a).

The purpose of this paper is to provide information about the relationship between play and cognitive development. Initially, the relationship is discussed from a theoretical perspective. This discussion is followed by a description of an empirical investigation in which two separate but interrelated objectives were met: to develop a methodology for naturalistic observations of children in their free play situations without access to auditory input, and to compare the observed play behavior of young profoundly deaf children to those observed behaviors of their hearing counterparts. Finally, the implications derived from the study are presented in terms of practical applications. These applications will be particularly useful to those educators concerned with the cognitive development of young hearing-impaired children.

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Play and Cognitive Development

The relationship between play, oral language, and cognitive development has been discussed by psychologists and educators for centuries. The language-determines-thought versus the thought-determines-language controversy continues as researchers investigate both sides of the issue. The proponents of the primacy of language position (language-determines-thought) maintain that without oral language, the human is bound to concrete levels of cognitive functioning. They believe that abstract thinking is a direct result of linguistic experiences (Chomsky, 1967; Whorf, 1956). A primary thrust of the work of psycholinguists has been towards investigating the universality of the structure of language development. They have found that across cultures children tend to develop oral language in a specific and similar sequence (Chomsky, 1967; Brown & Bellugi, 1964). This evidence tends to support the universality of the human predisposition to acquire oral language, but it does not address the issues of cognitive development and its relation to oral language. Because oral language is considered to be the catalyst for cognitive development, cognitive abilities have been measured using instruments in which verbal skills are necessary for successful examination to occur. The language-determines-thought proponents have not dealt satisfactorily with that population in which oral language is not evident--the population of deaf individuals.

Support for the language-determines-thought position is evident in most of the research dealing with children's play (this tendency may be unintentional). Creativity, intelligence, and various levels of play behavior have been measured with instruments requiring some level of oral sophistication. The nature of the instruments used requires that the children being assessed either understand oral directions or verbalize a response. These responses have then been incorporated into and compared with levels of play exhibited by children (Feitelson &

Ross, 1976; Saltz & Johnson, 1974; Saltz, Dixon & Johnson, 1977; Smilansky, 1968). In the above studies, the relationship between oral langu.ge and play has been confused with the relationship between oral language and cognitive abilities. What has not been determined is the relationship between play and cognitive abilities when oral language is absent. The advocates of the primacy of language position (language-determines-thought) have left two vital questions unanswered: (a) Can cognition develop adequately without oral language? and (b) What relationship exists, if any, between play behaviors and cognitive abilities when oral language is not evident?

Evidence contrary to the primacy of language position is presented by Piaget (1962) who maintains that the basic structure of cognitive development belies the necessity of oral language. Interaction and experiences with the environment enable the child to advance to higher levels of cognitive functioning. Although oral language, when it emerges, may enhance cognitive functioning, it is neither necessary nor sufficient for cognitive development to proceed (Furth, 1966). The antithesis of the primacy of language position then, would be that of the primacy-of-cognition: thought-determines-language. Support for the primacy-of-cognition argument is offered by an examination of cognitive development. The earliest stages of cognitive development consist of non-verbal, sensory-motor activities. This sensory-motor activity eventually involves activities which require the child to operate upon his environment at a level which is concrete and bound by his perception of that environment. As the child grows and continues to interact with his environment, he becomes less perception-bound and exhibits abilities which require abstract rather than concrete thought. Cognitive development, from sensory-motor activity to abstract thought processes, is thought to be the result of the child's interaction, exploration, and experimentation in and with his environment (Piaget, 1962).

The basic tenet of the primacy-of-cognition argument allows for the development of cognitive abilities independent of oral language as the primary manifestation of mental representation suggested by Piaget. Empirical evidence supporting Piaget's position is offered in a series of studies with deaf children. Furth (1966, 1971) concluded that deaf children proceeded through Piaget's stages of cognitive development in the same sequence as did their hearing peers. Through continuous interaction and experimentation with their environment, children develop their cognitive abilities. The cognitive changes that occur as a result of the child's interaction are considered "learning." It is the continuous experimentation and interaction with the environment which is the essence of child's play. Child's play is the catalyst for optimal learning (Fagan, 1975; Piaget, 1962, 1967). It is through play (i.e., interaction), not language, that cognitive development occurs. Play and cognitive development are mutually supportive, inseparable, and interdependent (Piaget, 1967). The developmental nature of play activities, from sensory-motor through abstract symbolic play, parallels cognitive development. In an attempt to integrate the psycho-social and developmental relationship between "play" and "work," Ellis (1973) maintained that play is only a theoretical possibility. Because play may result in some cognitive change, it might be considered "work." When placed on a continuum, any distinction between "play" and "work" is considered to be artificial. Ellis' view lends support to Piaget's contention that play and cognitive development (work) are inseparable.

The relationship between play and cognitive development has been examined in several recent research studies. Sutton-Smith (1967) found that play is important at various levels of development and for a variety of reasons which facilitate future successes of the child. Play affords the opportunity for the child to increase his variety of responses to situations he may encounter as he grows. In

a study involving lower socio-economic level children, Sigel (1966) observed a great deal of motor play, little role-play, and less sophisticated construction with blocks. These same children also exhibited a significant inability to categorize in representational terms. These results suggest that play may be related to representational thought, as was suggested by Sutton-Smith (1969), and that play might enhance that ability. In an attempt to relate playfulness with a creativity dimension, Lieberman (1965) concluded that children who were more playful also scored higher on several tasks requiring novel responses. Although criticized for confounding the variables of playfulness and creativity with scores on intelligence measures, the results tended to support Sutton-Smith (1967) and Sigel (1966). The lower socio-economic level children had fewer play experiences and consequently played in a qualitatively different manner (i.e., less role-play). The above research, although not conclusive, does lend support to the Piagetian concept that play is not only essential to cognitive change, but may well be a primary agent for cognitive change. The proponents of the primacy-of-cognition theory provide answers to the two vital questions left unanswered by the proponents of the primacy-of-language theory: (a) Cognitive development does occur without oral language, and (b) A mutually inclusive and supportive relationship exists between play behaviors and cognitive abilities when oral language is not evident.

Perhaps the most crucial issue to the problem at hand deals with the relationship between play and the development of symbolic functioning. Vygotsky states that the "use of a substitute object is the child's first step in the transition from things perceived as objects of action, to things perceived as objects of thought. These substitution activities contribute to and reflect cognitive development" (Vygotsky, 1967, 211-212). Pretend-play is seen by

Vygotsky as "facilitating the child's construction of a functioning symbol system detached from objects and actions."

Piaget (1962) views symbolic play in a somewhat similar manner, as derived from the structure of the child's thought. Representational thought is a prerequisite for symbolic play, "just as the symbol replaces mere practice as soon as thought makes its appearance" (Piaget, 1962, 142). Symbolic play, rather than diminishing in later life, becomes differentiated during the course of development and becomes more adapted to reality. During symbolic play, thinking takes the form of substitute actions, objects become internalized, and actions occur without the actual object. (It is interesting to note that Piaget (1962) views language as facilitative of symbolic play but not essential to it.) Symbolism in Piaget's view provides the child with the live, dynamic, individual language indispensable for the expression of his subjective feelings for which collective language alone is inadequate (Piaget, 1962).

Play symbols indicate that the child is beginning to interpret the special properties of situations (Fein, 1979). In addition, two general functions of pretense or symbolic play are noted by Klein (unpublished manuscript): (1) the separation of meaning from actions and objects, thus helping the child acquire a system of signifiers to represent meaning, and (2) provision of opportunities to use these signifiers to organize higher levels of meaning (Fein, 1979).

Play, then, can be viewed as a necessary component to the development of cognitive skills. More importantly, play can be considered as a possible index to the development of cognitive abilities. Available evidence suggests that the cognitive skills related to play include a sense of competence, the ability to make-believe, increased variability of responses, the ability to use representational skills, higher levels of creativity, greater use of imagination, greater facility in divergent thinking, the ability to synthesize and create experiences,

determination of causal relationships, increased ability to distinguish reality from fantasy, increased problem-solving abilities, higher level of associative fluency, an increased awareness of body and space, and the organization of time-space relationships. In addition to the above skills, play (specifically pretend-play or symbolic play) is viewed as both reflective of and derived from the symbolic thought of the child. It follows logically, then that information as to the level of a child's cognitive symbolic functioning could be obtained by an examination of the child's play behaviors.

Cognitive Development of Hearing-Impaired Children

Success on traditional instruments which evaluate intelligence requires some level of linguistic competence. When existing procedures have been used to evaluate the intellectual development of deaf children, the overriding conclusion has been that their development is retarded or delayed (Templin, 1950; Myklebust, 1960). It has been assumed that if the early education of deaf children could compensate for this language deficit, they would be more intelligent, or at least score higher on intelligence tests. The circularity of this argument tends to lend credibility to the primacy-of-language hypothesis, i.e., if language determines thought, and language does not develop normally, then thought will not develop normally. The primacy-of-cognition proponents would take issue with the above conclusion, i.e., if thought develops independently of language, then the cognitive development of deaf children would proceed in spite of the missing oral language component.

Obtaining information about cognitive development in deaf children has been hampered by methodological limitations. However, some studies are available which address the issue of cognitive development in deaf children. In a series of Piaget-type tasks designed to measure various aspects of concept formation, Oleron

(1975) found that the performance of the deaf children was inferior to that of the hearing population. The deficiency was not attributed to the deaf children; rather, Oleron suggested that insufficient experience with the conceptual areas might account for their inadequate performance. Furth (1966, 1971) designed a variety of tasks derived from the investigations of Piaget (1962, 1967) which he used in an attempt to determine levels of cognitive functioning in deaf children. The performance of the non-verbal deaf children on cognitive tasks involving conservation, concept attainment, and memory was, in most instances, equal to the performance of their hearing peers. Further documentation was obtained in a study with non-verbal deaf adolescents. On a task requiring logical functioning with written symbols, the deaf adolescents performed adequately. This finding indicated the presence of intact structures for logical thought (Furth & Youness, 1965). Although Furth alluded to the effects of language deprivation in the deaf population, he concluded that this deprivation did not affect the development of intellectual abilities. Rather, he concluded that "...the basic development and structure of the intelligence of the deaf in comparison with the hearing is remarkably unaffected by the absence of verbal language" (Furth, 1966, 227).

Play and the Hearing-Impaired Child

It has been suggested that play may be a primary agent for cognitive change. Available evidence suggests that the development of cognitive abilities in deaf children appears to be unaffected by their deficient linguistic skill. Therefore, an examination of the play of hearing-impaired children could provide additional information regarding the relationship between play and cognitive development. "There have been no studies reported in the literature which systematically explored the spontaneous play behavior of hearing-impaired children" (Kretschmer, 1976, 10). Kretschmer observed seventy-one pairs of children (one of each pair was hearing-impaired) who were matched on nine variables. The observations,

however, were made in an artificial situation, i.e., a television studio constructed to resemble a nursery school in which the children were arbitrarily placed for observation. Not surprisingly, the hearing-impaired children displayed more scanning behaviors, less actual play, more physical activity, and did not interact socially with their hearing counterparts (whom they did not know). Another attempt at play observations included a series of fairly elaborate investigations regarding play patterns in young hearing-impaired children. Darbyshire observed that, although slowing down as the children grow older, "the evolution of play in young hearing-impaired children seems to follow the pattern described by Piaget" (Darbyshire, 1977, 25). The observations in these instances were made by a play therapist who collected data both in and out of classroom situations. However, the aspects of play of particular interest were motor, constructive, and dramatic. In addition, social participation and the use of games was also observed. In neither case above was the actual play behavior observed, i.e., what the children were actually doing when they played. Other studies which supposedly examined play in hearing-impaired children examined: (a) levels of social participation, (b) levels of communication, and (c) types of communication or other specific play activities (Screng & Kirk, 1938; Schlesinger & Meadow, 1972; Vygotsky, 1966; Meadow, 1968). Apparently the actual play behavior of young hearing-impaired has not been fully investigated.

In order to discover whether symbolic development is evident in the play of hearing-impaired children, data which deal with the actual play behaviors of young deaf children are needed. Once available, that information can be compared to similar observations regarding the play behaviors of young hearing children. Such a study would make it possible to extend the understanding of play as it relates to the cognitive development of the hearing-impaired child.

Design, Procedures, and Results

Purposes

The present investigation dealt with play observations of young children. Two separate but interrelated objectives were met. The first was to develop a soundless methodology for naturalistic observation of children in their free play situations without access to auditory input. Therefore, one purpose of the study was to develop a soundless methodology for observing young children at play. The second objective of this investigation was to compare the play behavior of young profoundly deaf children to their hearing counterparts. The second purpose of this study then, was to use a set of data, collected under conditions and using methodologies which were equivalent, to compare the play behavior of profoundly deaf children with the play behaviors of their hearing counterparts along three dimensions: social play, socio-dramatic play, and organization of play behavior.

Subjects

The subjects were five hearing-impaired children and five matched controls with normal hearing. The hearing-impaired children comprised the entire population of deaf children enrolled in Richmond City schools who fulfilled four requirements for inclusion in the study: (a) severe-to-profound hearing losses (60 dB minimum, ISO, 1964) which were congenital or acquired shortly after birth; (b) between the ages of 36 to 72 months; (c) not familiar with any formal manual communication systems; and (d) no other handicapping condition. These children were all enrolled in the same preschool class.

The hearing subjects were selected after the deaf subjects had been identified. Each was matched as closely as possible to a deaf subject on the basis of birth date, sex, socio-economic status, and race. These children had no handicapping condition and were enrolled in one day-care center.

Data Collection

The procedure for collecting the observational data has been previously used in studying the play of young children (Shure, 1963; Parten, 1933; Smilansky, 1968; Hulme & Lunzer, 1966). During the hour of free play in the classes for both hearing-impaired and hearing children, the observer tape-recorded descriptions of the behavior of one subject at a time for a fifteen-minute period. One-minute intervals were signalled into the recorder for later use. All behaviors that occurred during each fifteen-minute observation were recorded. To assure that all subjects were observed during the entire free-play period, the fifteen-minute segments were rotated for each subject. This procedure assured that each subject was observed during all four segments of the hour.

Only the visually observable behaviors were of interest in the present study and any verbalizations made by the children were not heard by the observer. Silence was especially important during the observations of the hearing children, since only in this way could their visual play behaviors be made equivalent to those of their hearing-impaired counterparts. For this reason the observer was fitted with a set of earmolds and an obsolete hearing aid (Sonotone Model 2175) which produced complex noise. The complex noise served as a masking device which eliminated the possibility of hearing any verbalizations which might have occurred.

Interrater Agreement

To determine the objectivity of the descriptions of the play behaviors, two independent observers described one fifteen-minute play period for four subjects. The eight transcribed descriptions were then coded on two of the three play scales (Social Play and Socio-Dramatic Play). The analysis involved percentage of agreement (90% minimum) in coding for each pair of observations for both scales. There was 100% agreement on the Social Play Scale between both raters on all transcripts.

High agreement (92% average) between both raters on the Socio-Dramatic Play scale was also reached.

Data Reduction and Coding Procedures

For each fifteen-minute observation, the child's behavior was described into a portable tape recorder. The tapes were then transcribed by a professional typist. The one-minute intervals, signalled by the observer, appeared on the transcriptions as an asterisk (*). The asterisk marks were numbered 1-15 for each of the four transcriptions for each subject. At each asterisk mark, the behavior being described was coded along the dimensions of play behaviors described on three different play scales (social play scale, socio-dramatic play scale, and organization-of-play behaviors scale). In order to determine the consistency of the coding process, three randomly selected play transcriptions were coded by three independent coders. The coding procedure was determined to be consistent if 80% overall interrater agreement was reached between the three coders on each transcript for each scale. The overall agreement for coding procedures was 83%.

Play Behavior of Deaf and Hearing Children

The second objective of this study was to compare the play behaviors of the deaf subjects to the play behaviors of their hearing counterparts using conditions and methodologies which were equivalent. One central concern of the present investigation involved the developmental nature of play. The scales used for interpretation of the play behaviors observed were chosen because they dealt with some aspect of play development. The subjects used in the study represented three different age groups (three-year-olds, four-year-olds, and five-year-olds). Within each age group were an equal number of deaf and hearing subjects. Two fundamental questions regarding play development were addressed: (1) Is the developmental sequence of play behaviors consistent across subjects in this study, both

deaf and hearing? (2) Is there a relationship between the three play scales used in the study which facilitates the understanding of play as a developmental phenomenon? Because the two questions are related but independent, the discussion of the analysis is done for one question at a time.

Developmental nature of play. The central concern of the first question--the developmental nature of play--was examined in a series of steps. The first step involved analyzing the data on the Social Play scale, the second involved analyzing the data on the Socio-Dramatic Play scale, and the third step involved analyzing the data on the Organization of Behavior scale. The data from each of the three scales were examined and analyzed in terms of comparisons along the dimensions of age-of-subjects and hearing-status of subjects.

The first stage of the data analyses was designed to answer the following questions for each of the three play scales:

1. Is there difference in level of play development reflected in the play behaviors of the children at each successive age?

2. Is there a difference in the level of play development of deaf children when compared to their hearing counterparts?

In order to answer these questions, several comparisons were made for each play scale and are described below to facilitate understanding of the analysis process.

Several steps were involved in the data analysis of the three Play Scales. Initially, a simple frequency count for each of the categories of play behavior was obtained over each observational period. It was then possible to determine how many minutes of the hour each subject spent engaged in each of the categories of play. The next step involved translating the number of minutes into percentages of time-per-hour. These percentage frequency counts of play behaviors were organized for all subjects at each specific age (i.e., all three-year-olds, four-year-olds, and five-year-olds).

The frequency counts were then totalled for all deaf and all hearing subjects. Finally, the frequency counts were totalled for all deaf three-year-olds, deaf four-year-olds, deaf five-year-olds, hearing three-year-olds, hearing four-year-olds and hearing five-year-olds. The data analysis involved a comparison of frequency (minutes and percent of hour) in each category of play behavior for each subject. (e.g., deaf three-year-olds spent 14 minutes of an hour engaged in onlooker behavior and hearing three-year-olds spent 10 minutes of an hour engaged in onlooker behavior). From the above analysis it was possible to determine the extent to which deaf children differed in play behaviors from their hearing counterparts.

Relationship among the three scales. The second play development question addressed in this study was, "What is the relationship between the play scales?" Since the three scales were designed to examine a developmental element in play behaviors, it appeared likely that scores on any one scale would correlate with scores on each of the other two scales. In order to determine the magnitude of such correlations it was necessary to separate the components of each scale and to identify which part(s) of each scale dealt with more advanced levels of play. The continuum of categories of each Play Scale lists "unoccupied" as the lowest level of play and "elaboration" as the highest level of play.

The frequency scores for each subject by age and hearing status were then placed along the continuum. The results indicated that the higher categories of play which occupied at least 20% of the play hour (12 minutes) are associated with higher ages of the subjects (see Mann 1981 for full explication).

An examination of Table 1 reveals that for both deaf and hearing subjects, the percentage of time decreased for eight categories of play as age increased. Conversely, as age increased, the percentage of time spent in twelve categories increased also. The deaf children across all ages included in the study had

Table 1

Percentage of the Play Hour Spent in Each Category of Play Behaviors: Three Play Scales, Deaf and Hearing Subjects, By Age

Category	Deaf			±	Hearing			±
Age	3	4	5		3	4	5	
unoccupied	9	7	0	-	8	3	0	-
solitary	29	25	48	+	20	20	10	-
onlooker	12	14	10	-	12	16	10	-
no regard	9	3	2	-	27	7	0	-
no integration	7	3	2	-	28	7	0	-
some regard	25	32	12	-	41	5	15	-
parallel	29	30	12	-	36	37	32	-
routine behavior	33	32	18	-	40	5	3	-
obvious use	43	45	23	+	16	28	33	+
integ. sep. beh.	43	45	23	+	12	31	35	+
associative	16	24	18	+	16	19	38	+
transcends obvious use	22	2	12	+	5	22	15	+
high integration-disjointed	22	2	12	+	15	21	23	+
two children involved	38	57	65	+	47	63	58	+
use objects, actions, situations	25	54	79	+	59	57	100	+
agreement to procedure	18	34	45	+	24	63	45	+
cooperative	3	0	12	+	7	3	17	+
highly insightful	2	15	45	+	11	38	48	+
well-knit, sequential	2	15	45	+	5	37	48	+
elaboration	18	27	53	+	28	29	30	+

Notes: See (Mann, 1981) for full scale descriptions (use objects, actions, situations combined into one category)

Percentages have been rounded to nearest whole number
+ indicates an increase in percentage of time across ages
- indicates a decrease in percentage of time across ages

scores which were equal to their hearing counterparts in all but the number of minutes they spent in each category. The high level of play categories common to both groups, hearing and deaf subjects, suggests that the solitary play engaged in by the deaf subjects may incorporate high levels of play in addition to lower level of play. This finding is consistent with the conclusions drawn by Moore, et al. (1974) in which solitary play incorporates active, goal-directed behavior, large muscle play, puzzles, and is indicative of maturity and independence. The

five-year-old deaf subject spent almost one-half of his playtime engaged in solitary play. An examination of his behaviors during that solitary play tends to indicate maturity as suggested by Moore, et al. (1974) rather than immaturity as suggested by Parten (1932).

Discussion

In general, the play behaviors observed in this study followed the conceptual framework of play development found by other researchers using larger populations of hearing children (Parten, 1932; Smilansky, 1968; Hulme & Lunzer, 1966). The developmental sequence of the play behaviors of the deaf subjects proceeded through the same stages, in the same order, as the play behaviors of the hearing subjects on all three play scales: social play, socio-dramatic play, and organization of play behaviors. While not particularly remarkable, empirical evidence suggests that deaf children play much as hearing children do. some of the results lead to implications beyond numbers and tables. Specifically, play behaviors which are reflective of symbolic functioning can be identified.

Play has been viewed as reflective of cognitive development (Piaget, 1962). Symbol usage is a critical component of cognitive development (Piaget, 1962; Vygotsky, 1933, in Bruner, Jolly, & Sylva (Eds.), 1970).

> There is a growing mobility of internalized actions--the tendency for previously independent processes to become associated with each other so they are coordinated and fused within a systematic structure. The interpretation may be independent from language qua acquisition of speech--it can hardly be separated from the development of language as a symbolic function--language qua representation. (Piaget, 1957; Inhelder & Piaget, 1964; Co. 7 and Conclusions from Hulme & LUnzer, 1966).

Symbolic games are made up by individual children, played alone, and become characterized by make-believe and imitation (Takata, 1974). The make-believe, imaginative, and socio-dramatic play of young children can be viewed as an overt manifestation of their level of symbolic development. As such, the play of young

children would also be an indication of their levels of cognitive development. Based on the information obtained in the Mann (1981) study, it is possible to identify those specific play behaviors which are reflective of symbolic functioning (see Table 2).

Table 2

Symbolic Development as Representation Measured by Two Play Scales (Smilansky, 1968; Lunzer, 1959)

Socio-dramatic play
1. "Use of objects, actions, and situations in a way not bound by physical characteristics;" implies representational use; abstract
2. "Elaboration on a theme of play;" representational expansions in a sequence
Organization of Play Behaviors
1. 4-A - "Materials use transcends obvious;" representation
2. 4-B - "High-order integration;" several complex tasks all drawn together around a control theme; disjointed manner
3. 5-A - "Highly insightful use which transcends obvious properties" and adapted to context; representation symbol; deaf and hearing both do it
4. 5-B - "Well-knit and structured activity" involving complex tasks carried out in coherent sequence; symbol and sequence

Educational Implications

The practical implications of this procedure present a fair assessment of the cognitive abilities of non-verbal children. It would be possible to observe children at play, and based upon the level of play behaviors observed, make some decision about their level of symbolic use, i.e., representational thought. This type of information has been unavailable for populations of non-verbal children. This implication is to be considered with great care. Continued research with larger populations must be undertaken before acceptance or rejection.

The data from the present investigation suggest that the deaf subjects proceed through the same levels of play development at the same rate as their hearing counterparts. What was consistently different between the two groups in the study was the frequency of behaviors at each level. The question therefore has become quantitative, not qualitative. The deaf children observed in the study were engaged in play behaviors that were qualitatively similar, although sometimes quantitatively different than their hearing counterparts.

If play is an agent for cognitive change and if play behaviors are a manifestation of cognitive development, then an examination of play behaviors of young children could yield information about the level of cognitive functioning of those young children. More specifically, if symbolic functioning is a prerequisite for higher levels of cognitive development, and if symbolic functioning (representational thought) is essential to aid evidence in the higher levels of play, then an examination of the levels of play, then an examination of the levels of play behaviors exhibited by young children would yield information about the presence or absence of symbolic functioning (representational thought) and thus, higher levels of cognitive development.

Although the population of subjects was small and the implications must be carefully considered, the hearing-impaired children in the Mann (1981) study did exhibit play behaviors which indicated the presence of representational thought--a manifestation of symbolic functioning. In addition, the sequence of levels of play behaviors and the rate of play development was consistent between the hearing-impaired subjects and their hearing counterparts.

An overall difference between groups was found in play behaviors. This difference was not qualitative, but quantitative; the deaf subjects spent less time (number of minutes) than their hearing counterparts in the various levels and categories of play.

This quantitative discrepancy has direct implications when considering the educational environments of young deaf children. The quantitative difference could be caused by many factors. Oleron (1958) suggest insufficient experience; Furth (1966, 1971) suggests "lack of information, less opportunity and training to think, community" (1966, 226-227). The fact that the deaf subjects "used objects, actions and situations" less than their hearing counterparts does not mean that they are less advanced than their hearing peers. Rather, as suggested by Furth (1966, 1971) and Oleron (1958), they had less experience, training, opportunity or information. If lack of experience in play is a cause of low percentage of time in play categories, more experience may facilitate play development as was suggested by Freyberg (1973), Saltz and Johnson (1974), and Saltz, Dixon, and Johnson (1977).

Therefore, the teacher of the young hearing-impaired child must create a physical environment which encourages play. Wolfgang, et al. (1981), Kritchevsky, et al. (1977, 2nd Edition), and Jones (1973) provide a wide range of suggestions and activities. General guidelines are provided below for a play environment in an educational setting:

A. Play-house
    1. Kitchen/work area
        a. play food
        b. play dishes and utensils
        c. cleaning equipment: child-sized
        d. appliance: child-sized
        e. table and chairs: child-sized
    2. Bedroom
        a. dolls: a variety of sizes and colors
        b. doll beds
        c. doll clothes
    3. Dress-up area: organized and accessible
        a. clean, costumes
        b. adult clothing
        c. fabric which can become aprons, shawls, capes
        d. shoes, pocketbooks, brief cases
        e. hats, coats
        f. a full-length mirror

B. Large muscle play
   1. Riding equipment
      a. trucks
      b. cars
      c. bicycles
   2. Boxes and crates

C. Constructive play area
   1. Large wooden or cardboard blocks
   2. Puzzles
   3. Small blocks
      a. Lego's
      b. Unit Blocks
      c. Tinker Toys
      d. Lincoln Logs
   4. Open-ended multi-use materials
      a. inch cubes
      b. empty cartons
      c. "people" (Play-School type)

D. Process art area
   1. Painting
      a. finger
      b. brush
   2. Clay
      a. plasticine
      b. water-based
      c. pla-dough
   3. Color crayons
   4. Chalk

E. Sand or water table (also corn or rice)
   1. Funnels
   2. Containers
   3. Squeeze bottle

F. Carpentry area
   1. Wood or stump for hammering nails
   2. Tools
      a. screwdriver
      b. wrench
      c. hammer
      d. saw
   3. Small pieces
      a. nails
      b. screws
      c. nuts 'n bolts
   4. Lock box

G. Music area
   1. Piano or chord organ
   2. Record player/tape recorder
   3. Drums

In addition to creating the play spaces and arranging available play equipment, the teacher can take an active role in encouraging play by participating in play. A few considerations are suggested below (for a more complete description see Mann, 1981b):

A. Being available as a player

B. Creating unresolved situations in play

C. Using language naturally and as appropriate to the play situation, although this occasion is an ideal time to introduce, use and reinforce language, this period is play time and the teacher should not change it into a formal language or speech lesson

D. Being close to the children; physical proximity is often all that is necessary to invite children to join the teacher

E. Waiting for a natural break in the play of children before seeking a child for a special time with the teacher--interruptions are frustrating

F. Allowing ample time for play to develop; with the proper environment children will be busy playing all day

G. Providing active and quiet play spaces and times, allowing the children to pace themselves.

If we conclude that a lack of training to think was the cause for the discrepancy in the number and variety of play activities exhibited by deaf subjects, opportunities to do more than passively receive information should be provided by the teacher through:

A. Manipulative materials to use

B. A variety of centers in the classroom

C. Montessori materials

If "social factors of the home, school, and deaf community" are also considered to be causes of the discrepancy, those social factors could be examined, evaluated,

and reconstructed in a manner which would facilitate the number of opportunities for the children to think and to actively obtain information.

Thinking goes to school (Furth & Wachs, 1974) and The child's construction of knowledge: Piaget for teaching children (Foreman & Kuschner, 1977) are excellent references for the classroom teacher. With an awareness of the developmental level of the children, which may be obtained by observing them at play and by utilizing some of the suggestions offered above, the teacher will find a wealth of thinking opportunities which are implementable in the classroom.

A final restriction on the quantity of play behaviors exhibited by the deaf subjects may be attributed to the attitude of teachers. If play is viewed by the teacher as non-directional and frivolous, it is thought to be "not educational." Therefore, less time is allowed for play and little encouragement is given to the players. This perception poses perhaps the greatest challenge because it does require a change on the part of the teacher.

Conclusion

The information presented from this study has been purposeful. It has been presented to provide "disequilibration" in conceptualizing the value of play. As thinkers, teachers will strive towards "equilibration" and thus to reconceptualize; the result of the process of reconceptualizing these ideas about play can be cognitive change in children. It is only with change that growth occurs...from growth, more change. In the interest of young deaf children everywhere, we must work together to facilitate that growth.

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